

A Question of Response Rate

(within US Army Cargo Helicopter PM)



SSTC – April 2010

Mamie Danley Morgan
Mike Cowperthwait

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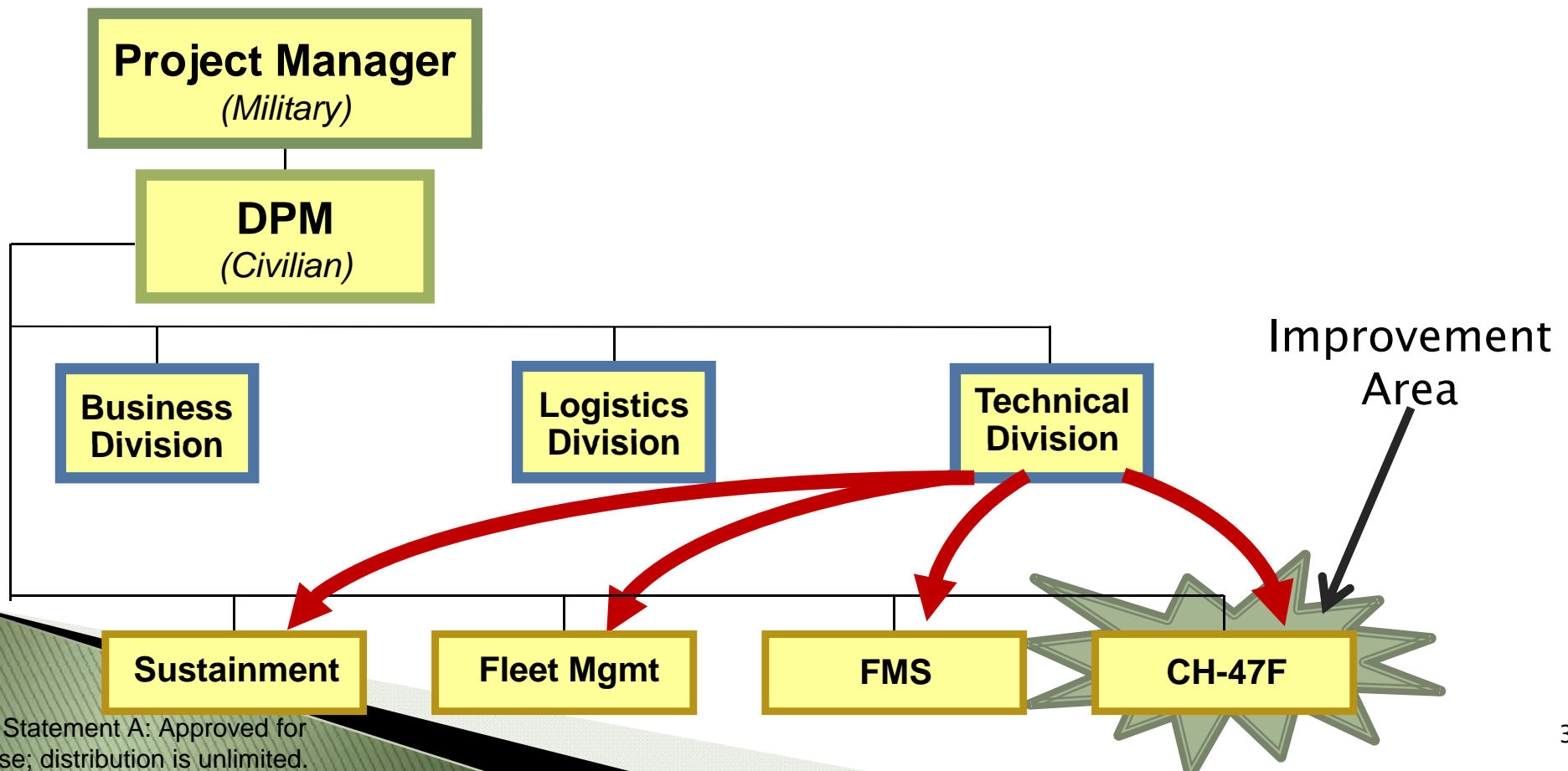
Agenda

- ▶ Environment / Infrastructure
- ▶ What Needed to be Done
- ▶ What We Did
 - Lean Six Sigma Project
 - Define
 - Measure
 - Analyze
 - Improve
 - Control
- ▶ The Results
- ▶ Challenges
- ▶ What We Learned



Environment/Infrastructure

- ▶ The environment is a typical high-visibility, rapid fielding government *acquisition* organization; our process, while repeatable, only deals with “custom” articles whose lead time is 18+ months per item.



What Needed to be Done

- ▶ DoD 5010.12-M *Procedures for the Acquisition & Management of Technical Data*, May 1993:

“An organizational element shall be assigned responsibility for *monitoring the distribution* of contractor-prepared data. Specifically, procedures shall be established to *ascertain actual receipt* of the data and to *ensure that all contractual requirements relative to technical data have been met...*”



- ▶ Lack of a management tool & a documented process in CH-47F Product Office meant:

- No predictive analysis
- Lack of document version control
- Data not readily available when needed
- Unclear document status
- Redundancies
- Lack of cross-checks
- No review time gates
- Lack of CDRL “ownership”
- No automatic routing
- No way for management to view status
- Time-intensive reporting

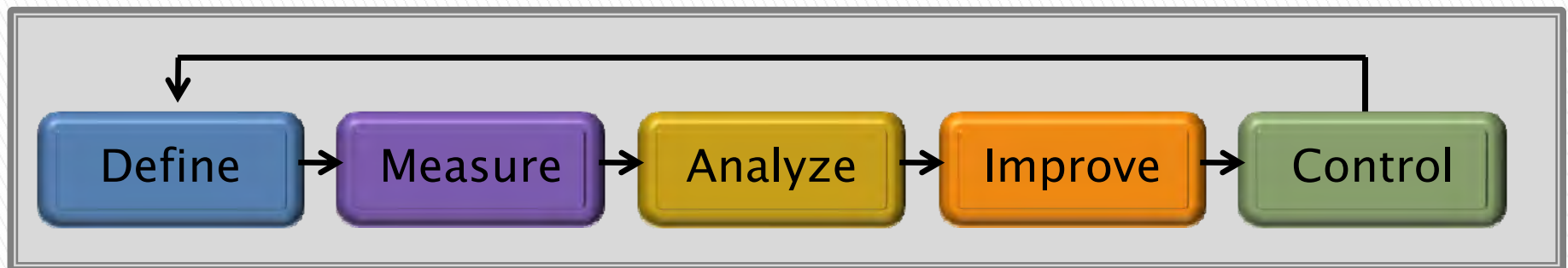
Why

Issues

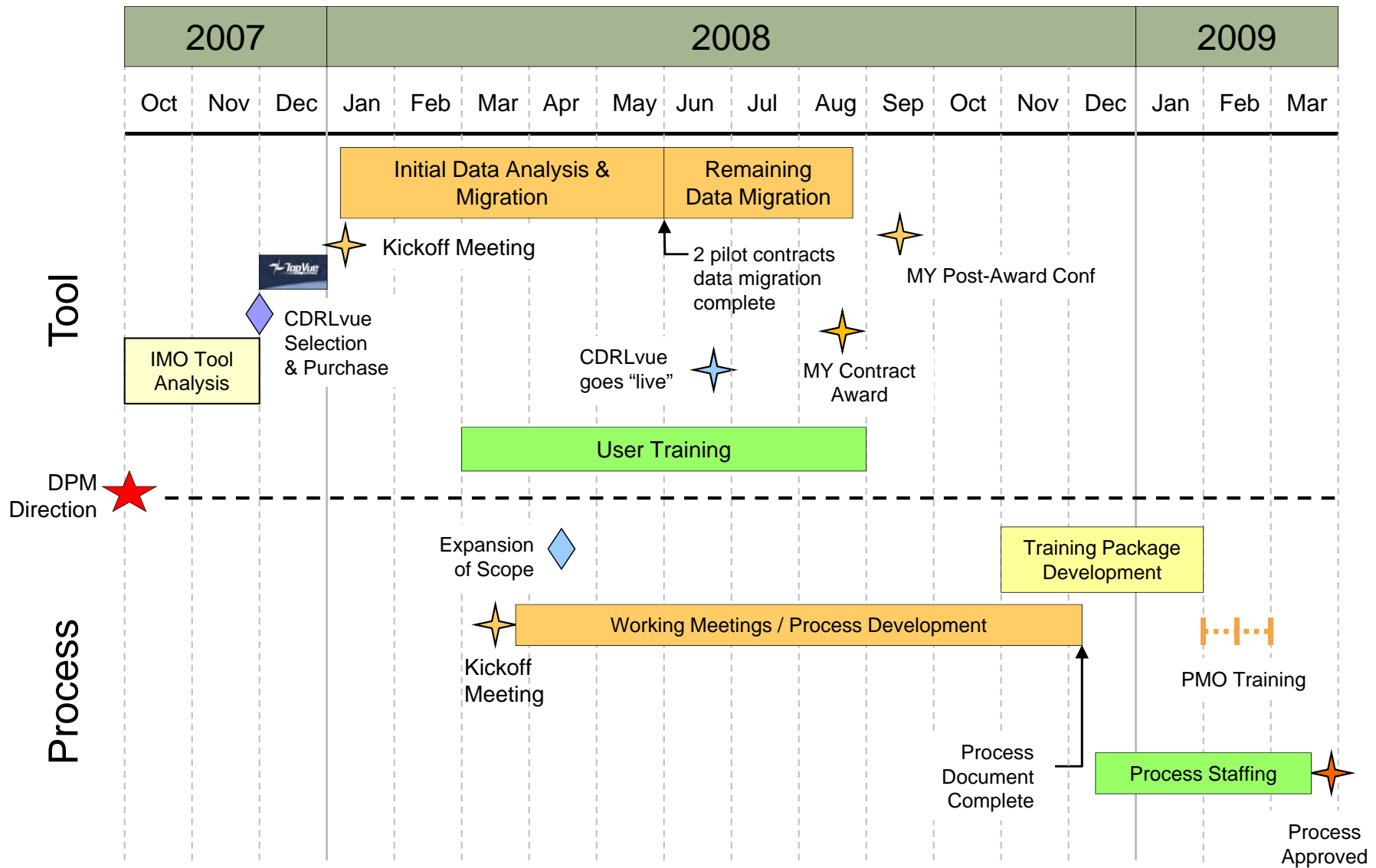
What We Did – 2-Pronged Approach

- ▶ **Tool:** CH-47F DPM provided direction to CM/DM Lead (Mike) to investigate, evaluate, and purchase a CDRL management software tool
- ▶ **Process:** CH-47F DPM directed Cargo Process Improvement Lead (Mamie) to charter a process action team addressing CDRL review

Lean Six Sigma Project



Timelines



LSS Project

- ▶ **Project Title:** Improving the Product Line's Data Item Deliverable Response Rate

- ▶ **Definitions**
 - Contract Data Requirements List (CDRL) – DD Form 1423: The standard format for identifying potential data requirements in a solicitation and deliverable data requirements in a contract.
 - Data Item Deliverable (DID) – DD Form 1664: A form that defines the intended use, preparation instructions, and content and format requirements for a specific data product.

The Charter

► Project Description

- Improve response rate to the customer (vendor) after internal product line review.

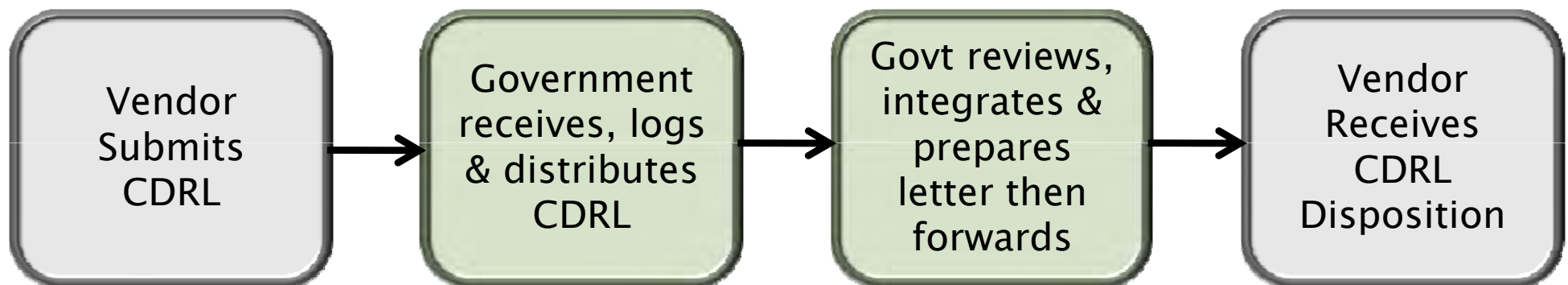
► Business Case

- Internal Government review of Vendor (Contractor) CDRLs were exceeding that period of time that was designated in the contract.
 - The lateness of responses causes delays in testing efforts, suspension of sub-contractor production, and impedes acquisition of long-lead items.
 - This has a domino effect, slipping an already tight production and fielding schedule of a critical wartime asset.

Process – Receipt & Review of Data Items

Suppliers = Vendors
(Contractors/OEMs)

Customers = Vendors
(Contractors/OEMs)



Inputs = CDRLs

Analysis Documents
Contract Documents
Cost Reports
ECPs
Plans
Prod Specs (PD)
Technical Reports
Test Plans

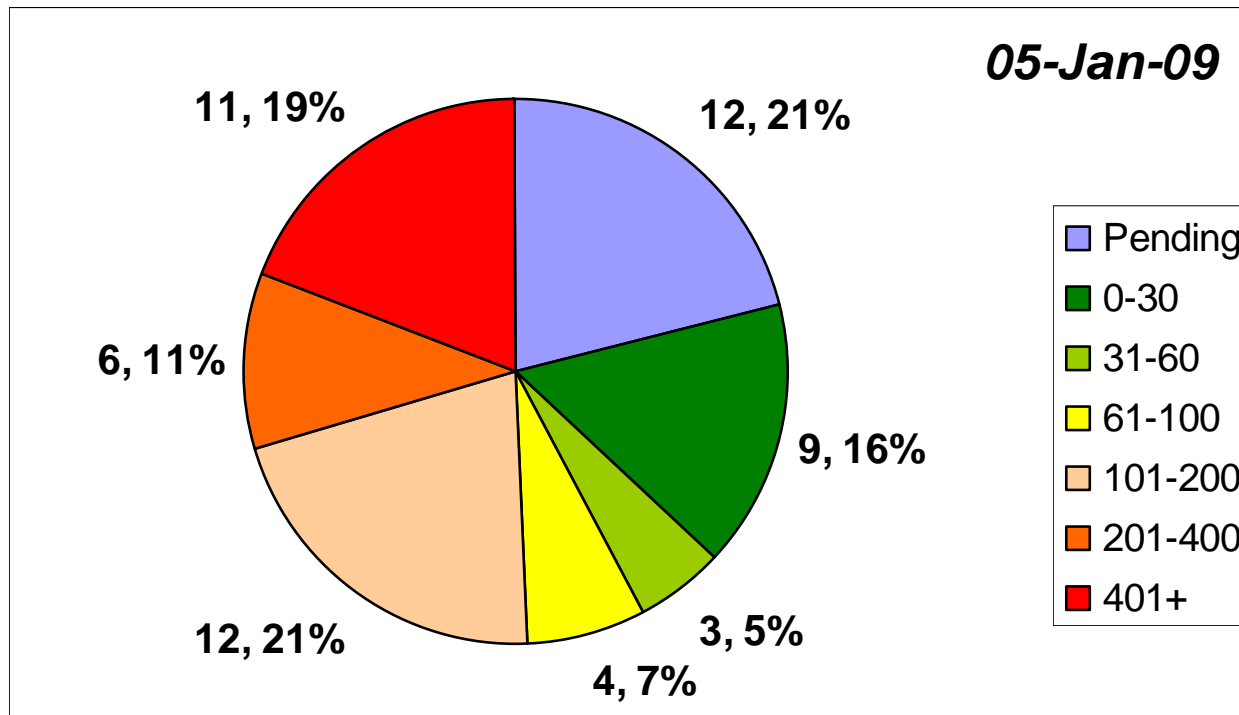
Outputs =

Disposition
Recommendations
Official Letter

The product line's response dates are specified in the contract with each requirement having a unique due date.

Starting Metrics

Response rates to the customer (vendor)
after internal Government review.



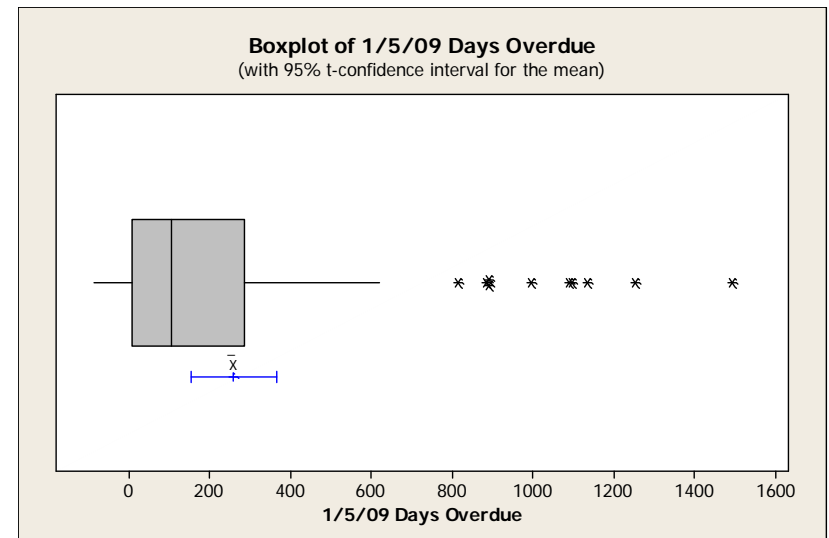
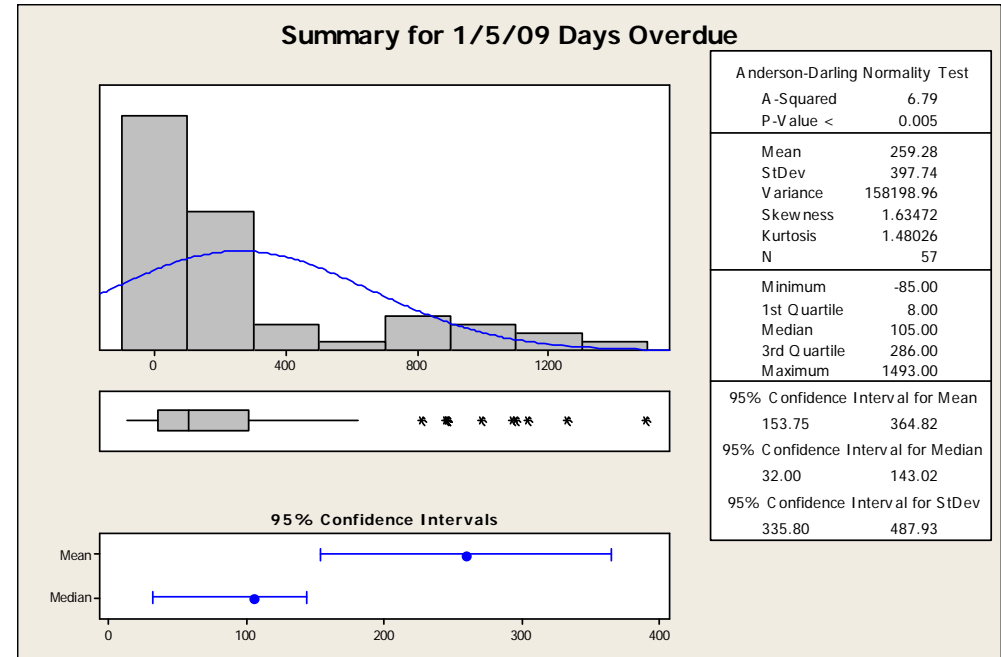
Goal:
Increase percentage rates of:

1. 61-100 days overdue,
2. 31-60 days overdue;
3. 0-30 days overdue; &
4. Pending

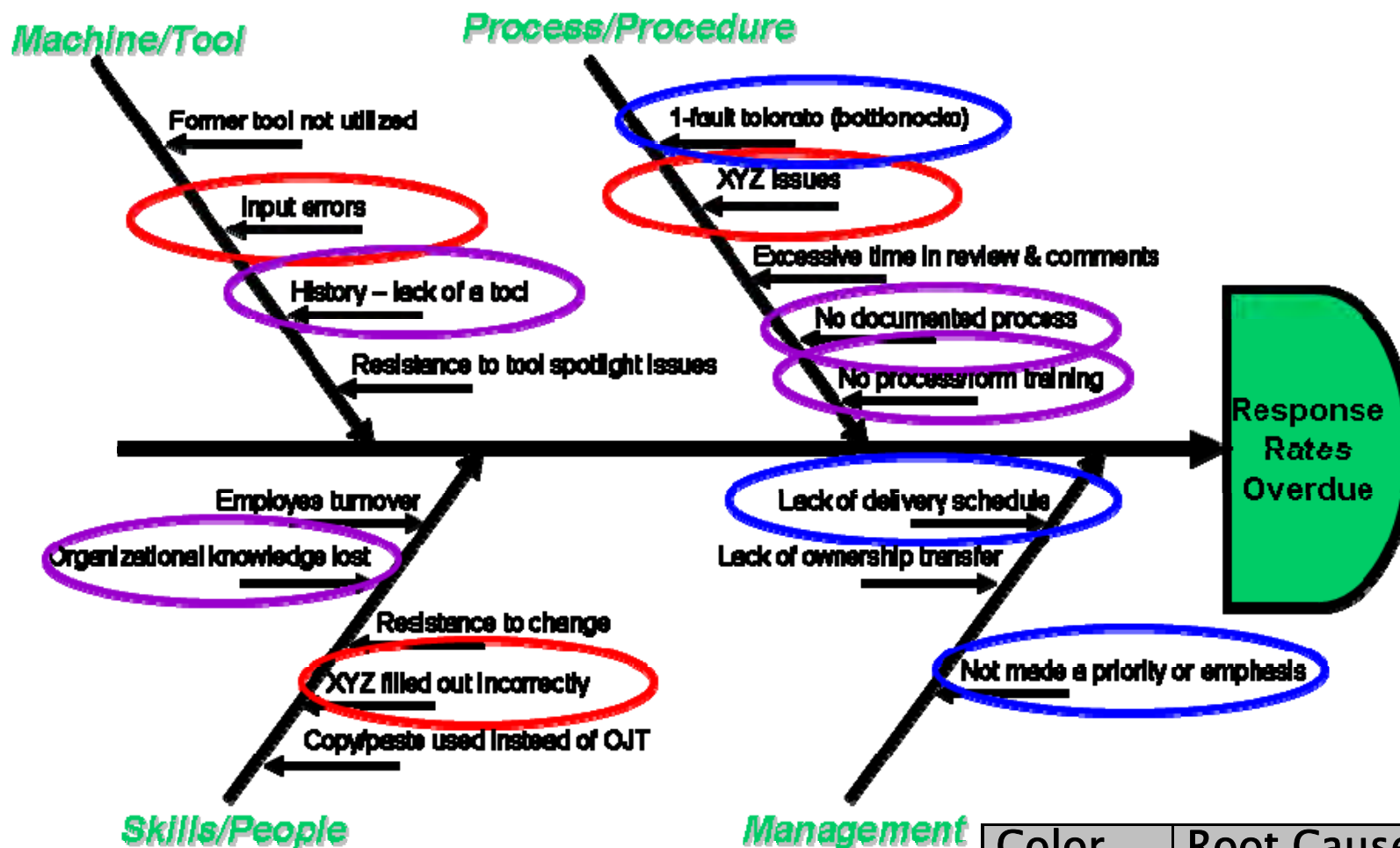
Project Sponsor/Owner imposed acceptable limit:
Upper Requirement Limit < 120 days

Starting Metrics (cont)

- ▶ **Descriptive Statistics**
 - Distribution = Non-Normal
 - Mean = 259
 - Median = 105
 - Standard Deviation = 397.7
- ▶ **Confidence Interval for the Mean: One-Sample T, Box Plot & Histogram**
 - Conclusion: It is taking too long to respond to the data item deliverable.
- ▶ **Process Capability** – process is NOT capable.
- ▶ **Process Probability** – low probability that we can make predictions.



Cause & Effect Diagram (or Fishbone)



Color	Root Cause
Red	Old data in database & XYZ Form
Blue	Little Management Support
Purple	Lack of Standard Operating Procedure (SOP)/Training

Action Plan

► Root Cause –XYZ Form

- Research the form and interview individuals to identify the “problem areas”.

- “App Code” field
- “Authority” field
- “Requiring Office” field
- “Remarks” field
- “Distribution” field

Out-of-date, but
DoD Mandated Form

Addressed all findings
in Form Training/
Cheat Sheet

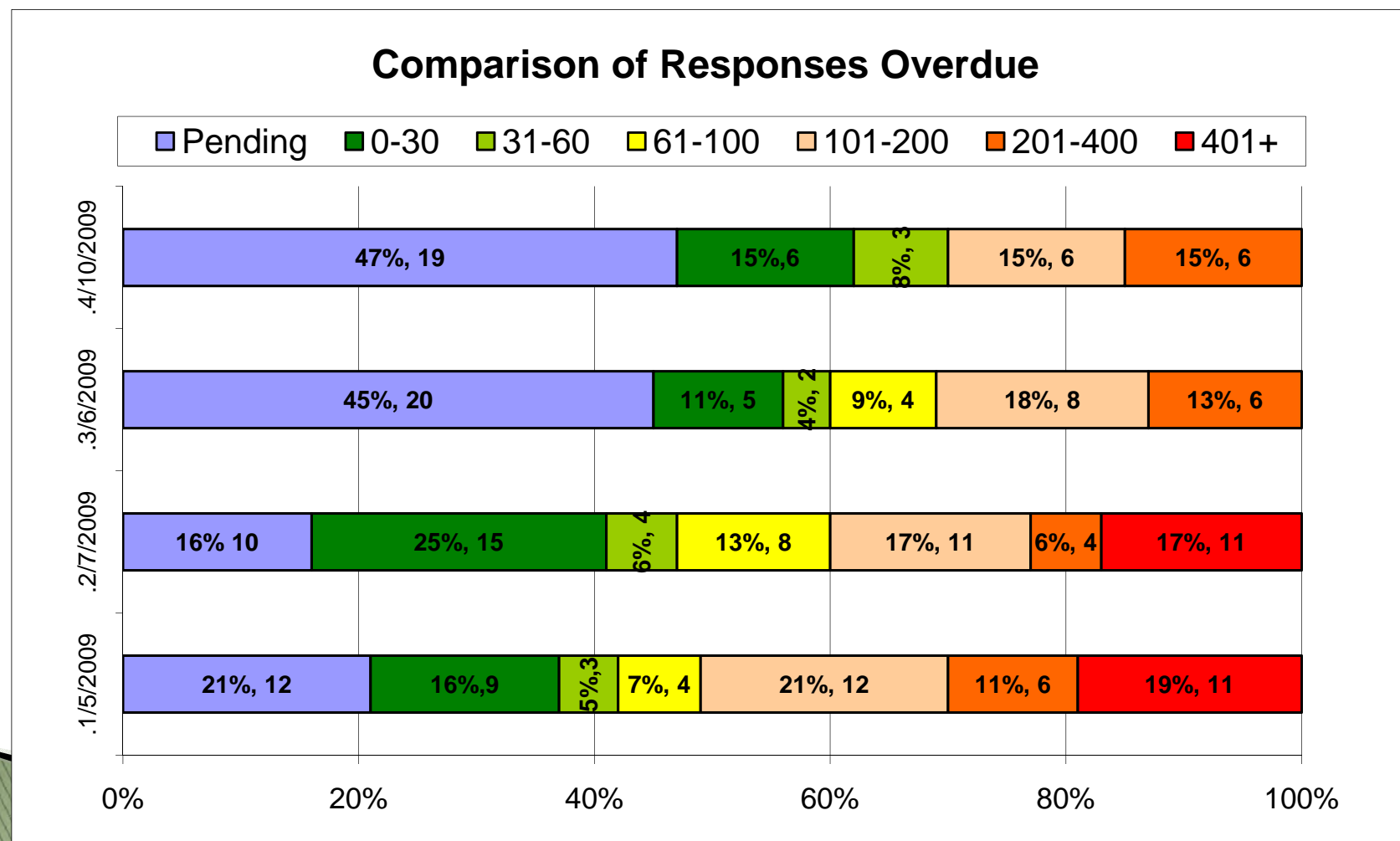
► Root Cause – Old data in database

- Perform housecleaning – reviewed & dispositioned every single CDRL



Action Plan (cont)

- ▶ **Root Cause** – Little Management Support
 - Develop a Dashboard

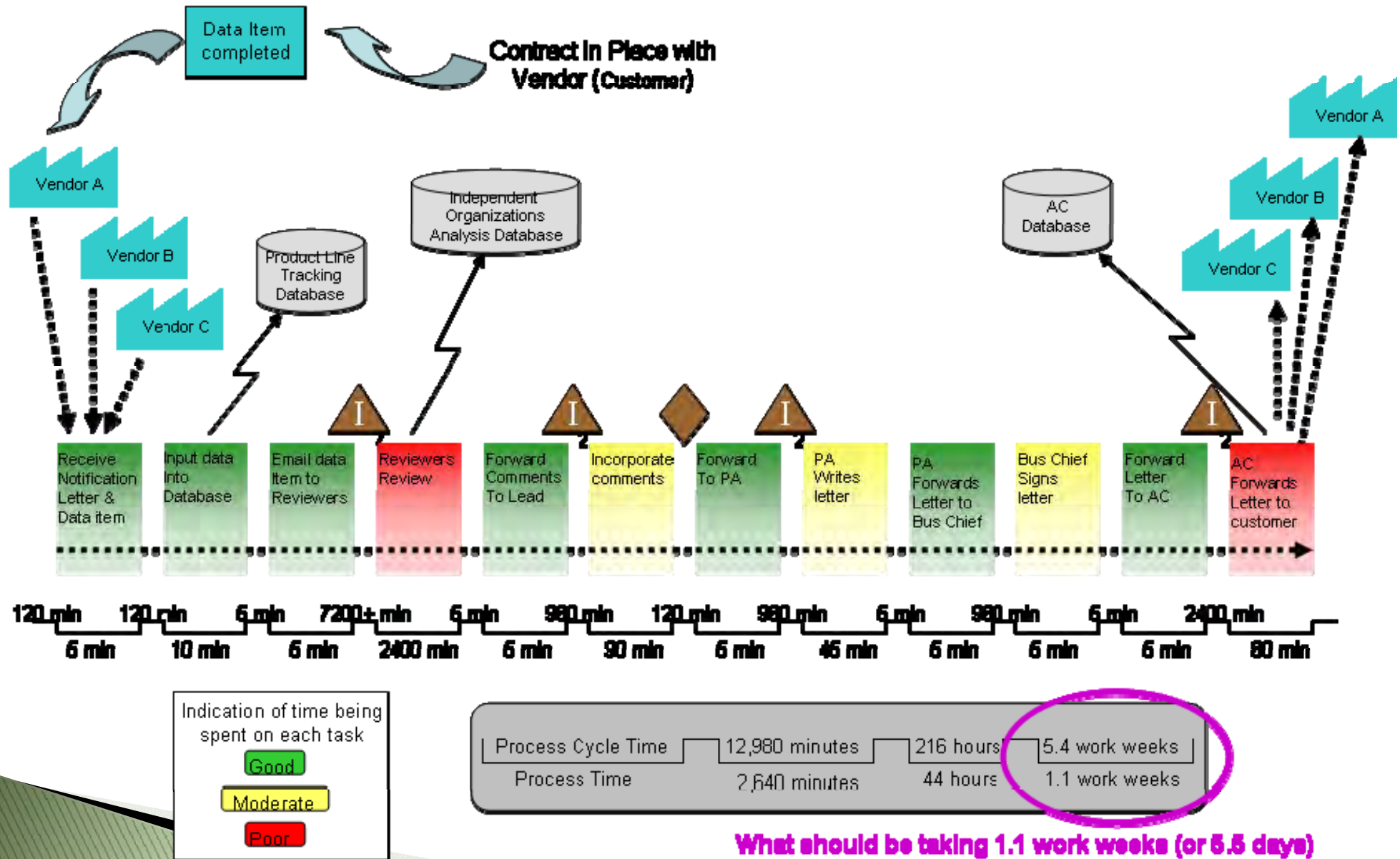


Action Plan (cont)

- ▶ **Root Cause** – Lack of Standard Operating Procedure (SOP) / Training
 - Develop a Value Stream Map
 - Voice of the Customer (VOC) Questionnaires
 - Draft SOP & Training Materials
 - SOP Training
 - Form Training
 - Cheat Sheet

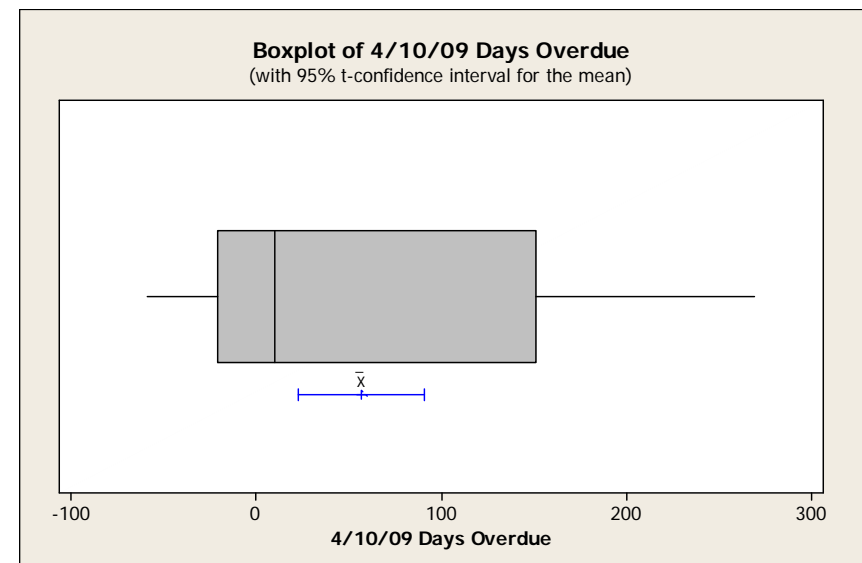
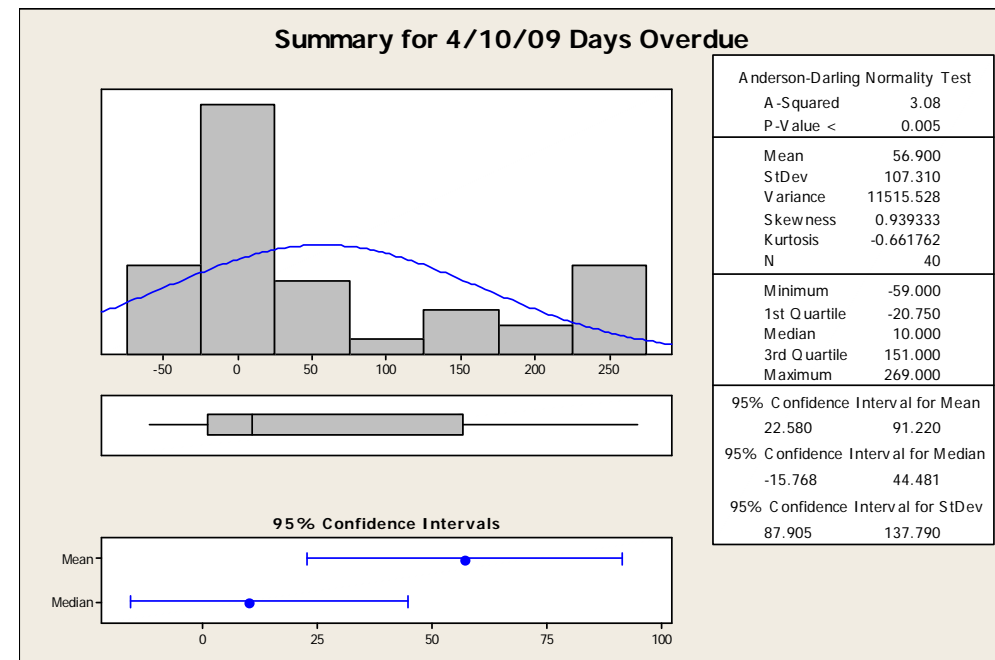


Value Stream Map



Ending Metrics

- ▶ **Descriptive Statistics**
 - Distribution = Non-Normal
 - Mean = 57
 - Median = 10
 - Standard Deviation = 107.3
- ▶ **Confidence Interval for the Mean: One-Sample T, Box Plot & Histogram**
 - Conclusion: It is taking too long to respond to the data item deliverable.
- ▶ **Process Capability** – process is NOT capable.
- ▶ **Process Probability** – low probability that we can make predictions.



Descriptive Statistics Comparison

- **Conclusion:** The Mean, Standard Deviation and Variance have all been decreasing throughout the efforts per the data collected and compared below, but the *process remains incapable, unstable, and unpredictable*. There is still a high level of variability in the process.

Variable	Total Count	N	N*	Mean	SE Mean	StDev	Variance	Minimum
1/5/09 Days Overdue	57	57	0	259.3	52.7	397.7	158199.0	-85.0
2/7/09 Days Overdue	72	72	0	201.4	41.8	354.9	125929.0	-38.0
3/6/09 Days Overdue	45	45	0	60.8	16.1	108.1	11681.4	-69.0
4/10/09 Days Overdue	40	40	0	56.9	17.0	107.3	11515.5	-59.0
5/13/09 Days Overdue	47	47	0	41.6	13.9	95.1	9045.3	-61.0
Variable	Q1	Median	Q3	Maximum	Skewness	Kurtosis		
1/5/09 Days Overdue	8.0	105.0	286.0	1493.0	1.63	1.48		
2/7/09 Days Overdue	-3.0	71.5	154.3	1460.0	2.03	3.07		
3/6/09 Days Overdue	-22.0	8.0	166.5	289.0	0.76	-0.81		
4/10/09 Days Overdue	-20.8	10.0	151.0	269.0	0.94	-0.66		
5/13/09 Days Overdue	-13.0	12.0	51.0	302.0	1.73	2.00		



Decreasing

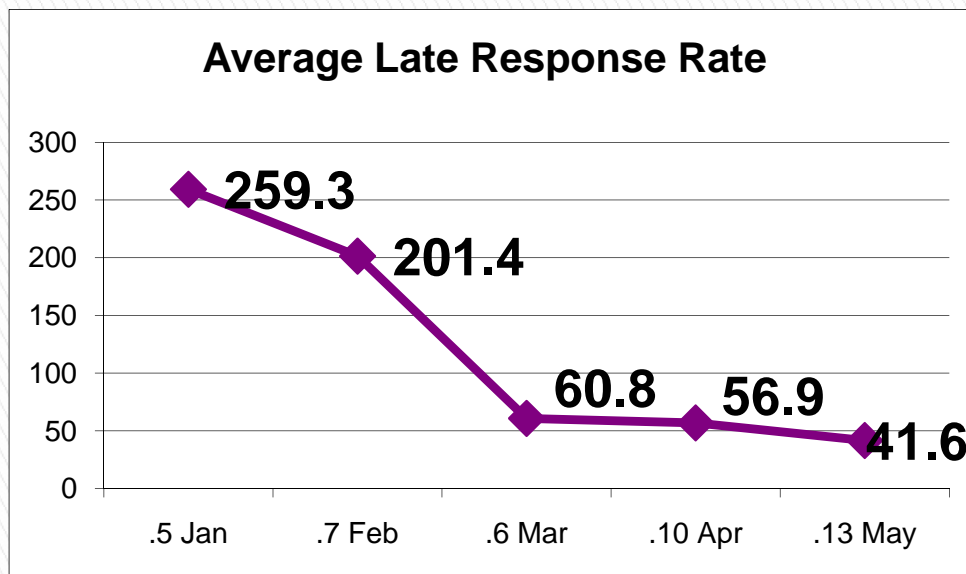
Sustaining

- ▶ Utilize Dashboard
- ▶ SOP & Form Training completed
- ▶ Cheat Sheet distributed
- ▶ Control Plan put in place
- ▶ Data collection continues



The Results

- ▶ Reduced the average late response rate from ~260 days to ~ 42 days in 6 mo.
- ▶ Captured a one-time cost avoidance of ~\$623,000.
- ▶ A large reduction in the backlog of data item deliverable responses
- ▶ Reduced waste and increased throughput
- ▶ Improved organizational capability to operate more efficiently and effectively.



Objective

Warm & Fuzzy

The Results – Calculations

	Every how many days	Time it takes (manhours)	\$\$	total per 10 days
Updating Schedule	10	N	\$N	\$
DM sends Reminders	10	N	\$N	\$
Reviewers (3) Re-Education	20	N	\$N	\$
			total	\$NNN

1/5/09 Days Overdue / 10 days + ~ \$647,318

4/10/09 Days Overdue / 10 days = ~ \$23,722

Cost Avoidance = ~ \$623,596

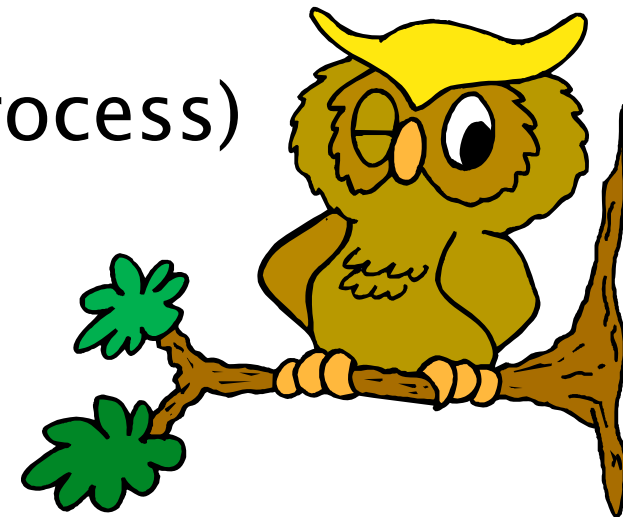


Challenges

- ▶ Installation of a new integrated software system to manage data deliverables;
 - ▶ Regulatory requirements to operate within strict DoD Acquisition processes and guidelines;
 - ▶ An out-of-date, but DoD mandated form;
 - ▶ Need of an organizational Standard Operating Procedure (SOP); and
 - ▶ Lack of an effective means of reporting review and response status to the management.
-
- ▶ Will not realize any benefits from SOP & Form Training for 12+ months

What Did We Learn

- ▶ Need to make improvements personal – how does it affect “me”
- ▶ Improvement has a domino effect
- ▶ Improvements build on each other
- ▶ Need for closely managing the pace of change
- ▶ Commonality & consistency
- ▶ Importance of training (tool & process)



Contact Information

► Mamie Danley Morgan

CH-47 Process Improvement Lead, Black Belt
QinetiQ North America

(256) 313-0716

DSN: 897-0716

mamie.morgan@us.army.mil

► Mike Cowperthwait

CM/DM Lead

Cargo Helicopters Project Mgmt Office

(256) 876-4583

DSN 746-4583

BB: (256) 509-6380

Fax: (256) 313-1915

michael.cowperthwait@us.army.mil